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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/916,629	08/22/1997	CHAD A. COBBLEY	97-0098	3496

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EXAMINER

AFTERGUT, JEFF H

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/916,629

Applicant(s)

COBBLEY ET AL.

Examiner

Jeff H. Aftergut

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 and 40-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 40-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-20 and 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krall in view of Chorbadijiev et al, the admitted prior art, either one of Zwick or PCT WO 97/06953 and either one of Loctite 410 or Loctite 416 optionally further taken with the state of the prior art as exemplified by at least one of Liang et al, Fogal et al, Farnworth, Davis and German Patent 4107347 for the same reasons as expressed in the Office action dated May 3, 2005, paragraph 2.
3. Claims 21, 22, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of either one of PCT WO/06953 or Zwick and further taken with Japanese Patent 58-196280 for the same reasons as expressed in paragraph 3 of the Office action dated May 3, 2005.

Response to Arguments

4. Applicant's arguments filed July 29, 2005 have been fully considered but they are not persuasive.

The applicant's arguments begin on page 15 of the response and continue to page 17 and these arguments are specifically addressed below. Regarding the rejection of claims 1-20 and 42-44, the applicant essentially argues that: (1) the prior art failed to disclose (a) a semiconductor packaging method which includes the steps of providing a cyanoacrylate adhesive, applying the adhesive to a die or a leadframe, and then polymerizing the adhesive without heating the die and the leadframe in

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less than about 60 seconds; (b) using a die attach system or a die attacher in a semiconductor packaging method to apply a cyanoacrylate adhesive and to press the die and the leadframe together; (c) using a volume of a cyanoacrylate adhesive material in a semiconductor packaging method to control a thickness of the adhesive layer; (d) using a cyanoacrylate adhesive in a semiconductor packaging method with a filler configured to tailor a characteristic of the adhesive, and; (e) using a catalyst in a semiconductor packaging method with a cyanoacrylate adhesive; (2) the reference to Krall is non-analogous prior art, and; (3) the prior art references failed to provide incentive or motivation for making the proposed combination. The arguments are respectfully traversed.

Regarding whether all of the features are found in the prior art applied, the applicant is advised that regarding argument (1)(a) the reference to Krall suggested that one skilled in the art would have utilized a cyanoacrylate adhesive to join a chip to contact leads. The reference to Chorbadijiev clearly provided evidence that the use of cyanoacrylate adhesives would have had a short cure time when used in the manufacture of electronic components. The admitted prior art clearly expressed that the cure times of cyanoacrylate adhesives were within the specified times claimed. Additionally, the references to Loctite 410 and 416 clearly expressed that the cure time would have been within 60 seconds. The ordinary artisan would have readily understood that an adhesive like the cyanoacrylate adhesive materials referred to by Krall would have been utilized to join a chip to a leadframe as such was common

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practice in the art as evidenced by any one of Liang et al, Fogal et al, Fanworth, Davis or German Patent '347.

Regarding the remarks made concerning argument (1)(b) the applicant is advised that the die attach system was admitted as known to the artisan as suggested by applicant's admitted prior art at page 9, line 22-page 10, line 2, for example. This has repeatedly been pointed out to applicant and there has been no specific response to the same other than to merely state that the references failed to teach the arrangement for attaching the chip to the leadframe.

Regarding the arguments made concerning (1)(c) above, the applicant is advised that the references cited to either one of Zwick or PCT '953 discussed previously disclosed the final thickness of the adhesive layer in the assembly of a chip to a leadframe. As expressed in the rejection presented December 6, 2004, paragraph 6, the specific volume would have been controlled in order to attain the specific thickness of the adhesive in the finished assembly and these reference suggested therefore the controlled volume of adhesive to be applied. Applicant does not address these references in this regard but merely states that the prior art failed to teach the volume while in fact the references did suggest the same.

Regarding argument (1) (d) and (1) (e), the applicant is advised that the reference to, for example, Chorbadijiev suggested that those skilled in the art would have incorporated a conductive filler with the adhesive material when making the electronic component. Clearly, use of filler with the adhesive would have been within the purview of the ordinary artisan when one desired to make an electrical contact as was

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known in the art. As for the use of a catalyst, the references to either one of Loctite 410 or Loctite 416 suggested that those skilled in the art at the time the invention was made would have incorporated an accelerator in the composition (a catalyst) when one desired to increase the speed at which the material set (cured). Certainly, it would have been within the purview of the ordinary artisan to utilize a catalyst with the adhesive in order to speed the cure of the same.

Regarding argument (2), the applicant is advised that the reference to Krall is clearly analogous prior art. The applicant is advised that Krall stands alone for what it teaches to those of ordinary skill in the art. While the gist of the reference is related to the use of cyanoacrylate adhesives in a surgical procedure, the reference expressly stated that those skilled in the art at the time the invention was made would have incorporated a cyanoacrylate adhesive to join a die to a leadframe where it states:

“Radiopaque cyanoacrylate compositions are also useful for the general adhesive applications to which cyanoacrylates are put, such as the bonding of metal, plastic and ceramic parts. Radiopacity of such compositions allows inspection of the integrity of the joined seam. For instance, in the manufacture of electronic microchips it has been suggested that MCA may be a useful adhesive for joining contact leads to the chips. Since a major failure mode of electronic chips occurs at the chip-lead interface, it would be advantageous if such cyanoacrylate adhesives were radiopaque so that the weld could be examined.” (column 1, lines 42-53, emphasis added)

clearly, the reference to Krall on its face suggested that those skilled in the art of semiconductor manufacture would have been well aware that a cyanoacrylate adhesive would have been useful for attachment of the chip to the leadframe in the manufacture of the electronic components. While the reference does not go on in any further detail of the processing, the artisan in the art of semiconductor manufacture and the attachment of components to leadframes would have known what was going on in Krall. The artisan

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in semiconductor electronic manufacture is highly skilled and would have known how to use the teachings of Krall to manufacture a suitable end product (whether the gist of Krall relates to such or not is immaterial to the question of obvious as defined herein and the prima facie case which has been established).

Regarding applicant's argument (argument (3)) that there is no reason to make the combination as proposed, the reasoning for the rejection has been established previously. The fact that applicant does not agree with the motivation or suggestions to make the combination is different from a lack of a reason for making the combination. Applicant has failed to specifically address what lack of motivation is being addressed. Applicant is referred to the previous prima facie rejections presented for the specific reasons as to why one skilled in the art would have made the combination.

Applicant also argues the rejection of claims 21, 22, 40 and 41 and states that the rejection failed to teach or suggest: (1) a semiconductor packaging method which includes the steps of providing an anaerobic acrylic adhesive material, applying the adhesive to a die or a leadframe, and then polymerizing the adhesive without heating the die and the leadframe in less than about 60 seconds; (2) using a die attach system to perform an applying step using an anaerobic acrylic adhesive material; (3) using a catalyst in a semiconductor packaging method with an anaerobic acrylic adhesive material. Additionally applicant argues that there is no motivation to combine the references as applied.

Regarding applicant's first argument, the applicant is advised that the admitted prior art suggested that it was known to join a chip to a leadframe with an epoxy resin

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using a die attach arrangement. The admitted prior art additionally admitted that anaerobic adhesives were known in the art and were known to be fast curing resins. The reference to Japanese Patent '280 expressly suggested that it was known to employ an anaerobic adhesive to join a chip to a leadframe. The reference did not expressly state that the cure time was within 60 seconds, however the speed of the curing of the anaerobic adhesives were known to have been within the specified time limit. Thus the prior art of record taught the use of the anaerobic adhesive to join the chip to the leadframe.

Regarding the second argument presented by applicant, note that applicant has admitted that it was known to use a die attach system to attach a semiconductor die to a leadframe (see the discussion above regarding the same).

Regarding the third argument, the applicant is advised that while the Japanese Patent '280 did not expressly disclose a catalyst for speeding up the reaction of the curing of the polymer, the applicant is advised that catalysts were well known for anaerobic adhesives and the use of the same to speed up the polymerization of the same is taken as conventional in the art of bonding. There is simply no unexpected benefit obtained by incorporation of the conventional catalysts with the anaerobic adhesives asserted by applicant and it would have been within the purview of the ordinary artisan to utilize the same in the process of attaching the chip to the leadframe.

Regarding the question of motivation to combine the references, as asserted previously one skilled in the art at the time the invention was made would have selected an anaerobic adhesive to join the chip to the leadframe as such would have increased

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productivity by increasing the speed with which one was able to attach the chip to the leadframe. Applicant has not specifically disputed the motivation previously presented but rather merely just stated that there is none. However as noted above, there is ample motivation to employ an anaerobic binder to join a chip to a leadframe.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The reference to Japanese Patent 3-215992 suggested that with an anaerobic adhesive for a circuit board for joining with the same that one skilled in the art would have included a catalyst with the same.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

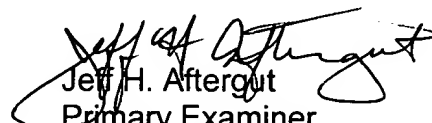
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff H. Aftergut whose telephone number is 571-272-1212. The examiner can normally be reached on Monday-Friday 7:15-345 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Dunn can be reached on 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jeff H. Aftergut
Primary Examiner
Art Unit 1733

JHA
September 6, 2005